



Spray application

For the past four years, the AWRI has been coordinating workshops on vineyard spray application in regions across Australia, with the most recent workshops held in Western Australia in November 2019. This column summarises the most common questions about spray application asked by participants.



How often should I replace the nozzles on my spray unit?

As a rule, if you have not changed the nozzles on your spray unit for five years or more, it is probably time to do so. A worn-out nozzle will not produce the expected output at a given pressure, so deterioration can be determined by measuring output over time. The flow rate (L/min) should be accurate to 10% of specification, at a given pressure. If the nozzle is not performing as expected, it should be replaced. A visual indication can be gained by looking at the spray pattern at operation pressure. Distortion in the spray pattern indicates wear or blockage and signals a need for replacement.

What droplet size should I be aiming for?

For vineyard canopy sprays, the ideal droplet is classed as 'fine', or 100 to 175 microns in diameter. Droplets that are smaller than this are prone to drift and are difficult to control. These 'very fine' droplets are also more susceptible to loss through evaporation. Droplets that are medium sized or larger are less of a drift risk, but due to their size are less likely to be caught in the turbulent air that allows drops to be deposited on the backs of leaves and bunches. 'Coarse droplets' are unsuitable for spraying in an established grapevine canopy because they are prone to bouncing off the target rather than settling;

coverage from this size of droplets tends to be poor.

A 'coarse' or 'very coarse' droplet output is necessary for herbicide spraying under vines because it greatly reduces drift risk. A dormancy spray, where the goal is to drench the trunk or cordon, might also call for a coarse droplet. To avoid chemical losses, the use of a shrouded spray unit that captures any spray that misses the target is best practice.

How can I tell if my spray unit is set up correctly?

The only way to tell if you are getting good coverage of the target is via visual assessment. This does not mean looking out the window as you drive down the

row. Water-sensitive papers are relatively easy to use, provide a good indication of the range in droplet sizes achieved and can provide a record of sprayer performance for future reference. These are good to use during sprayer set-up because the results can be observed straight away. The addition of a product such as 'Surround' (kaolin clay) to the tank leaves a visible mark on the vines which is easy to observe once the spray has dried. The feedback you get is relatively quick, and while messy, it can show spreading and coverage on all plant surfaces. Fluorescent dye can also be used in visual assessments but needs a UV light source and dark conditions to show up, meaning it is not practical for sprayer set-up. An advantage of the dye is that it is easy to see off-target spray losses and identify very low level deposits on surfaces.

Spray unit performance is aided when the machine is well maintained. Keeping filters and fans clean and ensuring pumps and pressure gauges are operating properly are critical to good performance. Having someone observe and critically assess the machine in operation from a distance can be a source of very good feedback about where the spray plume is going.

How do I know what volume of water to apply to my canopy?

The standard answer to this question is to spray to the point of run-off, which is the

point when the leaves are just beginning to drip. The problem with this answer is that not all parts of the canopy being sprayed will have the same coverage at any one time, so some leaves may be dripping while others are dry. Trying to achieve dripping leaves on the inside of the canopy is not a good solution because it means the outer canopy will be awash with spray solution which will end up on the ground. The goal is to set up the spray unit so there is even coverage inside the canopy while the outer leaves are covered just prior to the point of run-off.

The CRCV Research to Practice manual on spray application identified the following factors to consider when estimating the point of run-off:

- Recognise that you won't get same level of wetness everywhere and that the evenness of canopy wetness is important.
- Leaves near the sprayer will show signs of run-off before inner parts of the canopy.
- Adjust the sprayer so that the inner canopy gets adequately sprayed before run-off begins on the outer canopy.
- Run-off has not been reached if the inner canopy is mostly dry, even if the outer leaves are dripping.
- Droplet size influences the point of run-off, as a canopy can hold quite high volumes without appearing very wet if the droplets are very fine, whereas large droplets begin to run from outer leaves at relatively low volumes.
- When targeting bunches, the point of run-off should be based on the level of wetness and coverage on berries.
- Adding a wetting agent to the tank mix will cause run-off to occur at lower volumes than without the wetting agent.
- Use water-sensitive papers during sprayer set-up to help estimate when the point of run-off has been reached.

Reference

Cooperative Research Centre for Viticulture. 2006. Research to Practice Spray Application in Viticulture manual.

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For more information about spray application or any other technical winemaking or viticulture questions, contact the AWRI helpdesk on 08 8 313 6600 or helpdesk@awri.com.au.

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